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Undergraduate fashion and apparel programs strive to keep up with the changing needs of fashion industry employers, especially with respect to technology. Experience using design software is one necessary skill for fashion designers, but which software program or programs to teach is a question fashion faculty must grapple with as they strive to keep curricula current and relevant. While some software packages may be donated to schools as a gift, there are still substantial hardware, training, and support costs involved with maintaining and teaching specialized software solutions at a university. To this end, an examination of industry requirements for apparel design technology was conducted to determine if curriculum offerings are aligned or mismatched with industry needs.

A 2012 survey of fashion design software use by industry professionals shows the most commonly used programs are Microsoft Excel, Adobe Illustrator, and Adobe Photoshop. A 2006 survey yielded similar results (Carrico, 2006). Of the fifty respondents for the 2012 survey, 56% had been in the field between one and five years, 18% between 5-10 years, and 20% more than ten years. When asked to "check all that apply" for job responsibilities, 68% checked "fashion design," 52% checked "product development," and 50% checked "technical design." Surprisingly, 34% checked "CAD/textile design" and only 20% checked "patternmaking." With more than two thirds of respondents identifying fashion design as their responsibility, their software use should be indicative of what undergraduates in fashion design need to learn.

The survey asked professionals to rate how often they used programs such as Excel, Photoshop, Illustrator, PDM/PLM products, and specialized textile design (Kaledo, Ned Graphics, etc.) using a scale from 1-7 with 1 being "rarely" and 7 being "very frequently." Excel received an average rating of 5.8, Illustrator scored 5.71, and Photoshop was 5.02. PLM and patternmaking software both had average scores below 3, and textile design software was only 1.72. When asked to rate programs based on importance of a fashion design graduate knowing them, Illustrator, Photoshop and Excel were, again, at the top of the list.

Concurrent to the professional survey, researchers visited the three web sites (wwd.com, stylecarrers.com and fashionjobstoday.com) from January through September in 2012 to collect data regarding software proficiency requirements from open position announcements. The data was collected through content analysis for fashion design jobs, focusing on those needing associate/assistant designer, product development, CAD designer and technical designer. Focusing on the required software programs in each position announcement, data was coded in the coding sheet developed by the researchers (0=not required, 1=required). Additionally, job title and required number years of experience were recorded to find the relationship with the software requirements. A total number of 1219 cases were analyzed in SPSS 18.0 program. In

total, announcements were analyzed for 824 associate designers (67.6%), 228 assistant designers (18.7%), 156 technical designers (12.8%) and 11 other positions (0.8%). This study found correlation between software proficiency qualifications and the years of experience in the field ($r = -.083$, $p < .05$). That is, a higher familiarity with software programs is required to offset a lack of experience. So students do need to demonstrate software proficiencies when interviewing for jobs, but which programs are most necessary?

Table1. Frequency of software programs

	Frequency (%)		Frequency (%)		Frequency (%)
Email	185(15.2)	Photoshop	811(66.5)	Streamline	10(0.8)
Power point	185(15.2)	Illustrator	1041(85.4)	Textile design[a]	34(2.8)
Word	370(30.4)	Bridge	12(1.0)	Pattern Making[b]	37(3.0)
Excel	530(43.5)	InDesign	48(3.9)	PLM, PDM[c]	288(23.6)

[a] U4ia, Nedgraphics, Kaledo, Primavision, Point Carre; [b] Modaris, Accumark, Gerber; [c] Siemens, Bluewater, Micrographix, DeSL

As shown in Table 1, 85.4% of position announcements required Illustrator proficiency and 66.5% of the announcements sought Photoshop skills. PLM/PDM programs were addressed in 23.6% of advertisements, and only 2.8% specified textile design programs such as Kaledo or U4ia. Along with the software programs, 10.0% of jobs wanted hand sketching proficiency. Results of the analysis also show a relationship between job title and required software programs. Nearly all the assistant design positions stated a need for Illustrator while only 4% specified textile design software. In fact, among associate and assistant design positions, Illustrator was mentioned more than twice as often as Excel, with Photoshop falling between the two. For technical designers, Excel was the most frequently required program, while Illustrator was close behind; PLM/PDM did rank higher than Photoshop for technical designers. When focusing on the specialized programs for textile design and patternmaking (Ned Graphics, OptiTex, etc.), our analysis of the open positions shows very little need for them among associate/assistant designers or technical designers. In fact, the need was much greater across the board for PLM / PDM than for the other specialized programs.

Finally, the above data is reviewed in light of additional survey data showing half of college and university level fashion design educators report that their program devotes one semester or more to "formal instruction" for the specialized textile design and/or patternmaking software. In fact, the amount of time spent "dedicated to teaching" Photoshop and Illustrator is not much greater than that spent on the specialized programs. This begs the question of "are the needs of the students and the industry being duly served" when so much time is allocated within a fashion design curriculum to teaching patternmaking software and textile design programs instead of building skills in those programs more in demand and in use, Adobe Illustrator, Photoshop. We will share full survey results during our presentation and discuss how they might impact future apparel design curricula decisions.

Carrico, M., & Leslie, C. (2006, November). *Incorporating technology in apparel design – what does the industry use?* Paper presented at the meeting of International Textile and Apparel Association, San Antonio, TX.